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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/048,104  | 06/17/2002  | Hans-Rolf Dubal      | 514453-3912         | 1522             |
| 20999   | 7590        | 05/03/2004           | EXAMINER            |                  |
| FROMMER LAWRENCE & HAUG<br>745 FIFTH AVENUE- 10TH FL.<br>NEW YORK, NY 10151 |             |                      | WANG, GEORGE Y      |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2871                |                  |

DATE MAILED: 05/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/048,104

Applicant(s)

DUBAL ET AL.

Examiner

George Y. Wang

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12-19 is/are pending in the application.
- 4a) Of the above claim(s) 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Claims 12-18 in Paper filed on February 13, 2004 is acknowledged. The traversal is on the ground(s) that it is improper under because Applicant's argue that searching all the inventions would not constitute an undue burden. This is not found persuasive because Group II, Claim 19, clearly recites a chiral smectic liquid-crystal mixture that is different than the chiral smectic liquid-crystal mixture as recited in Group I, Claims 12-18. The Group II mixture describes a separate and distinct subcombination since the mixture has the phase sequence, I-N-C, characterized in that the addition of 10% by weight, based on total mixture, of a smectic A inducer leads to the occurrence of an smA phase range of less than 5.5°C, and the addition of 25% by weight, based on the total mixture, leads to the occurrence of an smA phase range of at least 0.1°C, which is not recited anywhere in Group I. Furthermore, the Group II subcombination has utility in combinations and Group I, as claimed, does not require the particulars of the subcombination as claimed for patentability. Therefore, Examiner disagrees that the Restriction will not cause undue burden since Group I and II are drawn to different types of mixtures and uses. As such, Restriction is proper.

2. This application contains claim 19 drawn to an invention nonelected with traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (U.S. Patent No. 5,629,788, from hereinafter "Mori") in view of Takatori (U.S. Patent No. 6,351,301) and Applicant's Admission of Prior Art (AAPA).

5. As to claim 12, Mori discloses a liquid crystal display device (title) comprising a chiral smectic liquid crystal mixture in alignment, characterized in that the liquid crystal mixture has the phase sequence I-N-C and the angle  $\rho$  between the rubbing direction and the monostable position is at least  $1^\circ$  (table 1).

However, the reference fails to specifically disclose a mixture in monostable alignment.

Takatori discloses a liquid crystal display device comprising a chiral smectic liquid crystal mixture in monostable alignment (col. 3, lines 37-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a chiral smectic liquid crystal mixture in monostable alignment since one would be motivated to have a correspondence in which a brightness is changed only but one polarity of voltage (col. 3, lines 44-46). This not only increases reliability and control, but also permits continuous display, such as grayscale display (col. 3, lines 31-32).

6. Regarding claims 13-14, Mori discloses the liquid crystal display device as recited above having a tilt angle at  $25^\circ\text{C}$  is between  $19^\circ$  and  $39^\circ$  and a spontaneous polarization of less than  $150\text{ nC/cm}^2$  (table 1).

7. As per claim 15, Mori discloses the liquid crystal display device as recited above, however, the reference fails to specifically disclose that the device is an active matrix or passive matrix display.

AAPA discloses a nonstructured substrate combined with an active matrix substrate (pg. 1, lines 20-23).

It would have been obvious to one of ordinary skill the art at the time the invention was made to have included the device in an active matrix display not only because it is common and well known in the art to do so, but since one would be motivated to create non-linear elements, such as diodes, metal insulator metal, and TFTs, which are advantageously produced in such a combination (pg. 1, lines 20-28).

8. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori, Takatori, and AAPA in view of Fuss et al. (U.S. Patent No. 5,547,605, from hereinafter "Fuss").

Mori discloses the liquid crystal display device as recited above, however, the reference fails to specifically disclose the pitch of the cholesteric helix greater than 2  $\mu\text{m}$  and sulfur-containing heterocyclic compounds, which derive from thiophene and are at least 20% by weight.

Fuss discloses a liquid crystal mixture for I-N-C phase sequence (col. 1, line 35) having where pitch of the cholesteric helix greater than 2  $\mu\text{m}$  (col. 1, lines 37-38) and containing sulfur-containing heterocyclic compounds (col. 2, line 55 – col. 4, line 10), which derive from thiophene (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the aforementioned specifics since one would be motivated to achieve optimum contrast and alignment (col. 1, lines 28-33). The

introduction of thermal, chemical, and photochemical stability allows quick and shortened response time (col. 2, lines 7-15), useful in wide viewing angles and reliable switching (col. 1, lines 5-19).

### ***Response to Arguments***

9. Applicant's arguments filed February 13, 2004 have been fully considered but they are not persuasive.

Applicant's main argument is that the Mori reference does not disclose an asymmetric mono-stable chiral smectic liquid crystal mixture which is as a result of angle ratio values being larger than 0. First, Examiner points out that nowhere in Applicant's claimed invention is an "asymmetric" monostable mixture disclosed. Second, Examiner asserts that although the Mori reference does not relate to a monostable chiral smectic liquid crystal mixture which is as a result of angle ratio values being larger than 0, it does, in fact, disclose a chiral smectic liquid crystal mixture in alignment, characterized in that the liquid crystal mixture has the phase sequence I-N-C and the angle  $\rho$  between the rubbing direction and the monostable position is at least  $1^\circ$  (table 1). Clearly, Applicant's use of the conjunction, "or," in the claim language only requires either a ratio angle being at least 0.41 "or" the phase sequence I-N-C being at least  $1^\circ$ .

Therefore, Examiner holds to the validity of the reference used and maintains rejection.

***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gw  
April 26, 2004

  
ROBERT H. KIM  
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